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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/049,212	02/05/2002	Sang-Young Lee	B-4483PCT 619789-9	9084

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EXAMINER

CHEN, VIVIAN

ART UNIT

PAPER NUMBER

1773

DATE MAILED: 07/31/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/049,212

Applicant(s)

LEE ET AL.

Examiner

Vivian Chen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☒ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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## DETAILED ACTION

### *Specification*

1. This application does not contain an abstract of the disclosure as required by 37

CFR 1.72(b). An abstract on a separate sheet is required.

### *Claim Rejections - 35 USC § 112*

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 29 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for certain combinations and sequences of preparation steps (such as those set forth on pages 7-9 of the specification), does not reasonably provide enablement for *any* combination *regardless* of sequence. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims.

The specification fails to describe how a multi-component composite membrane can be produced with every possible combination and every possible sequence of the recited steps -- for example, the omission of step a); the use of step a) or h) alone; performing step e) prior to step d); or performing step a) or c) after step e) or h), etc.

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4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 17-29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 17, the phrase "with the help of an reactive gas" in step d) is vague and indefinite because it is unclear how the reactive gas is being utilized. Is the reactive gas being used as a means to somehow transfer, convey, or apply the polymer solution onto the precursor? Or is the reactive gas used as an adhesion promoting treatment *prior* to the application of the polymer solution (as indicated by the specification).

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed

7. Claims 1-5, 9, 12-13, 15-16 are rejected under 35 U.S.C. 102(b) as being anticipated by TASKIER (US 4,438,185).

TASKIER discloses a composite membrane comprising a support layer and an active polymer coating layer on at least one surface of the support layer, wherein the support layer

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comprises polypropylene having the recited density, pore size, and thickness, and further optionally has a reinforcing layer laminated thereto, and wherein the active polymer coating layer has the recited thickness (lines 14-30, col. 7; lines 5-11, col. 18; lines 2-9, col. 19; lines 10-45, col. 21; lines 45-50, col. 24; Example 1) as recited in claims 1-5, 9, 12-13. The membrane is suitable for use as a separator in rechargeable lithium-based batteries (line 54, col. 24 to line 65, col. 25) as recited in claims 15-16.

*Claim Rejections - 35 USC § 103*

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over TASKIER (US 4,438,185) in view of PENDALWAR ET AL (US 5,716,421).

Claims 1-5, 9, 12-13, 15-16 are rejected under 35 U.S.C. § 102(b) as being anticipated by TASKIER (US 4,438,185) as stated above. In the alternative, the claims are obvious for the following reasons:

TASKIER discloses a composite membrane comprising a support layer and an active polymer coating layer on at least one surface of the support layer, wherein the support layer comprises polypropylene having the recited density, pore size, and thickness, and further optionally has a reinforcing layer laminated thereto, and wherein the active polymer coating

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layer has the recited thickness (lines 14-30, col. 7; lines 5-11, col. 18; lines 2-9, col. 19; lines; 10-45, col. 21; lines 45-50, col. 24; Example 1) as recited in claims 1-5, 9, 12-13. The membrane is suitable for use as a separator in rechargeable lithium-based batteries or other conventional membrane applications (line 54, col. 24 to line 65, col. 25) as recited in claims 14-16. However, the reference does not explicitly disclose the recited active layer polymers.

PENDALWAR ET AL discloses that it is well known in the art to use polyvinylidene fluoride, polyurethanes, and other polymers recited in claim 6 (lines 42-58, col. 4) as the active layer on a composite membrane, wherein the polymers are applied to a support layer via a polymer solution containing a suitable solvent such as n-butanol (Example 1) as recited in claim 7.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use known membrane-coating polymers as disclosed in PENDALWAR ET AL in the composite membranes of TASKIER depending on the chemical resistance, transport characteristics, and other physical properties required for a specific application. One of ordinary skill in the art would have selected the porosity of the active layer, air permeability and wetting properties of the membrane (as indicated in claims 8, 10-11 in order to optimize the transport, electrical, or other physical characteristics for given usages.

#### *Allowable Subject Matter*

10. Claims 17-28 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

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11. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record fails to disclose or suggest the claimed method of forming a composite membrane, wherein an active layer is formed on the precursor film by application of a polymer solution. Specifically, LEE ET AL (US 6,540,953) fails to claim and WO 99/25464 fails to disclose the recited step of forming the active layer using a liquid polymer solution.

### *Conclusion*

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vivian Chen whose telephone number is (703) 305-3551. The examiner can normally be reached on Monday through Thursday from 8:30 AM to 6 PM. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Thibodeau, can be reached on (703) 308-2367. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9310 (for non-after finals) and (703) 872-9311 (for after-finals).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

July 28, 2003



Vivian Chen  
Primary Examiner  
Art Unit 1773